

summit of the pass where a tunnel for the railway was nearly completed before the troubled state of the country put a stop to the work. Owing to delays, usual in that part of the world, we were unable to start until ten o'clock. Partly on that account, and partly because snow had fallen during the night towards the summit of the pass, we resolved to halt at a point about 14,300 feet above the sea, and devote a couple of hours to the very interesting vegetation of that region. Although the path was not steep in that part, my horse, a spirited animal, already showed symptoms of distress, panting for breath and pausing at every few yards; but neither I nor my companion felt the slightest inconvenience during the day. On my return I fully expected some renewal of the symptoms of the preceding night, but to my surprise I slept perfectly on that as well as the succeeding night, as did also my companion. It seemed as if the ascent to a higher level and the return to Chiefa had the effect of acclimatising us.

I should mention that on the first two nights we both noticed one further symptom of derangement of the functions in the extreme turbidity of the secretion from the kidneys, but this as well as the others disappeared on the third night. I failed to detect any disturbance of the respiration or the circulation, although my attention was specially directed to these which are the ordinary, but not invariable, symptoms of mountain sickness.

J. BALL

#### DREDGING IN THE NORWEGIAN FJORDS

BEFORE leaving this enchanting spot (Lervik on the island of Stordoe near Bergen) where, in company with Mr. A. G. Bourne, I have spent the month of August, I send a few hurried lines to give an outline of the results which a month's dredging and microscopising have yielded. Lervik was introduced to me by the Rev. Alfred Norman, who two years since found here, at a depth of 100 fathoms in the Hardanger Fjord (about five miles from Lervik haven), that very remarkable Polyzoan mollusc, *Rhabdopleura*. Mr. Norman originally discovered this organism off the Shetlands, and it has since been described from specimens observed in the Lofoten Islands by Prof. G. O. Sars, who was able to give a more complete account of it than had been possible for Prof. Allman, who described and named Mr. Norman's Shetland specimens preserved in alcohol.

During ten days of my stay here I have had the great advantage of the company of Mr. Norman, whose knowledge of dredging operations and of the northern marine fauna is unrivalled. My object has been to make a further study of *Rhabdopleura* upon fresh and living examples, and in this I have been successful. At first we found *Rhabdopleura* only at great depths attached to recently dead pieces of the beautiful coral, *Lophohelia prolifera*. But subsequently we have been able to dredge it and bring it in for study within an hour, having discovered it in water of only 25 fathoms depth at the mouth of the harbour where it occurs in the form of creeping colonies upon *Ascidia mentula*, and on dead shells. A body-cavity, tentacular skeleton, male reproductive organs, and various facts as to the mode of growth, gemination, and development of the polypides, are the new features which these specimens have so far brought to light, whilst they have also served to confirm in many important respects the description given by G. O. Sars.

Our next most important "find" has been a very interesting green-coloured Gephyrean, in all probability identical with the *Hamingia arctica* of Koren and Danielssen, known hitherto only by one spirit-specimen, described last year by the Norwegian zoologists, and by a second dredged here two years since by Mr. Norman, but as yet unnoticed. The published specimen appears to

have lost its frontal process or appendage, which was perfect in the one dredged by us. The aspect of the complete worm is precisely that of a green *Thalassema*, from which, however, it differs most importantly in the absence of genital setæ, and in the structure of the cloacal nephridia, as also in the number and structure of the oviducts. *Hamingia* is also remarkable, as is *Thalassema neptuni* (which I obtained last year in quantity on the south coast of Devon) for having in its perivisceral fluid a large number of corpuscles deeply impregnated with Hæmoglobin, which give to the fluid a blood-red colour.

The special feature of the sea-bottom at depths of 100 fathoms and upwards, in these Norwegian Fjords, is the abundance of corals and Alcyonians. Nothing can exceed the delicate beauty of the white branches of *Lophohelia prolifera*, with which our "tangles" are always filled. *Amphihelia ramea* is nearly as frequent. *Allopora Norvegica*, a fine example of the Stylasteridæ made famous by Prof. Moseley, is also very abundant. But the most splendid of these coral forms is the *Paragorgia arborea*, of which we have taken a stem as thick as a man's arm, its branches spreading over three feet, and all (when living) of a perfectly uniform rose colour, as though modelled in wax of that tint. Allied forms—*Paramuricia placemus* and *Primnoa lepadifera*—are not uncommon, the latter affecting a bright salmon colour. The soft parts of nearly all these forms have yet to be studied in detail, and the preservation of samples in the approved reagents has been our special care.

*Antedon Sarsii*, *Rhizocrinus lofotensis*, *Neomenia carinata*, and *Chaetoderma nitidulum* are amongst the scarce animals of exceptional interest which we have had the good fortune to dredge. On the other hand, *Terebratulina caput-serpentis* and *Waldheimia cranium* are very abundant in only thirty fathoms, and Mr. Bourne has commenced an investigation of their structure which has been hitherto neglected, probably on account of the marvellous completeness of the account given by Hancock of *Waldheimia Australis*, based though it was on the study of spirit-specimens. A first result is that *Terebratulina* is not monœcious, but males and females are distinct.

Amongst animals of common occurrence or of less interest from an anatomical point of view, we have taken the following, identified by Mr. Norman, who has himself a much longer list from this and other parts of the Norwegian coast. Of Echinoderms, *Psolus squamatus*, *Oligotrochus vitreus*, *Holothuria elegans*, *H. intestinalis*, *Echinocucumis typica*, *Echinus sphaera*, *E. Flemingii*, *Spatangus purpureus*, *Echinocyamus pusillus*, *Echinocardium ovatum*, *Goniaster Phrygianus*, *Porania pulvillus*, *Astrogonium granulare*, *Archaster Parellii*, *Luidia Sarsii*, *Solaster furcifer*, *Stychaster roseus*, *Cribella oculata*, *Asterias rubens*, *A. glacialis*, *Ophiopholis aculeata*, *Ophiocoma nigra*, *Ophioglypha lacertosa*, *O. albida*, *Ophiocolex purpurea*. Cf larger Crustaceans, *Hyas coarctatus*, *Galathea tridentata*, *Munida Banfica*, *Hippolytus securifrons*, *Pandalus annulicornis*, *Pasaphæa Savignii*. Of Sponges there are a very large number which have never yet been examined; amongst those recognised were *Thenia Wyville-Thomsonii*, *Geodia norvegica*, *Thecaphora* (a "Porcupine" form), *Quassilina brevis*, *Asbestophuma* (a new genus of Norman), and other common forms. The Rhizopods include some very extraordinary and large forms, abundant *Haliphysema*, *Astrorhiza limicola*, many arenaceous species, and a black sausage-like organism attaining a length of one-third of an inch, the skin of the sausage, membranous with an emarginate aperture at one pole—the contents hyaline protoplasm with an immense number of large dark green granular corpuscles embedded in it. Of the Nemertines and Chaetopods, I will not venture to speak without library, and the list of mollusca would fill a whole column of NATURE. One word I would say in conclusion, namely, that were a real zoological station, similar to that of

Naples, to be established in Northern Europe, it would be difficult to find a spot so admirably fitted as Lervik, on account of the richness of its fauna, and especially in view of the fact that the deep-sea fauna is brought almost to the door by the peculiar condition of the fjords, dredging up to 400 or 500 fathoms being attainable a few miles up the Hardanger.

E. RAY LANKESTER

Lervik, Stordoe, near Bergen, Norway, August 27

#### SCIENTIFIC RESULTS OF THE "JEANNETTE" EXPEDITION

THE last number (August 26) of *Der Naturforscher* contains a first attempt to lay down the scientific results of this expedition, in a paper by Herr H. Wichmann, based on the reports of Messrs. Melville and Danenhauer, and of the naturalist of the expedition, Mr. Newcomb. It is known that after having passed, on August 31, the wintering station of the *Vega*, the *Jeannette* sailed north, towards Wrangel's Land. But on September 5, when twenty miles north-east of Herald Island, she was frozen in, and during twenty-one months remained so, "the play of winds and currents." However drifted in different directions, she still advanced during all this time towards the north-west. The first wintering was north of Wrangel Land, which last proved to be a large island, and not a part of an Arctic continent as had been presumed. The precious observations on auroræ and magnetism which were made during the winter (about 2000 measurements) are unhappily lost, as well as extensive collections of birds and of deep-sea fauna. The depth of the ocean in these regions was everywhere very small—thirty fathoms on an average, with a maximum of sixty and a minimum of seventeen fathoms. The bottom was usually a blue ooze, with a few shells and sometimes stones, which seemed to be of meteoric origin.

The ship still drifted towards the north-west, and on May 17 a small island, called Jeannette Island, was sighted in  $76^{\circ} 47' 28''$  N. lat. and  $159^{\circ} 20' 45''$  E. long. It was a rocky hill, covered with snow, situated on the eastern flank of a high mountain. Two days later another island was discovered towards the west, and an expedition under Mr. Melville reached it, with many difficulties, and landed on it on June 3, 1881. It was called Henrietta Island, and is situated under  $77^{\circ} 8'$  N. lat. and  $157^{\circ} 43'$  E. long.; it is rocky, and 2500 to 3000 feet high; the rocks are covered with nests of birds, but the vegetation is very poor, consisting of lichens and mosses, and of one species of phanerogam; all the island was covered with a sheet of ice and snow 50 to 100 feet thick, and a mighty glacier reached the sea on the north coast. As is known, on June 13, under  $77^{\circ} 30'$  N. lat., and  $155^{\circ}$  E. long., the *Jeannette* was lost, the depth of the sea being there 38 fathoms. The crew, divided in three parties, went south, but ten days later they perceived that, owing to the drift of the ice, they had still advanced 27 miles north-west, being under  $77^{\circ} 42'$  N. lat. That was the highest latitude reached by the expedition. On July 9 they perceived land, and after a hard journey, reached it at a promontory they called Cape Emma ( $76^{\circ} 38'$  N. lat.,  $148^{\circ} 20'$  E. lat.). This island, which received the name of Bennett, is a high mass of basalt, covered with glaciers; the island was crossed by a party, after two days' travel, and the north coast proved to be more hospitable than the south; it has several valleys covered with grass, where reindeer bones and drift-wood were found; lignite was discovered on the south coast, and it is said that it would be quite useful for steamers. Dr. Ambler here collected fossils, as well as many amethysts and opals, but they were lost. The gulls were so numerous and so tame that hundreds of them were killed with sticks; the tides were regular, but very small, the level changing only two and three feet. The sea was free of ice in the west and south, and even

in the north-west a "water-sky" was seen, so that M. Danenhauer supposes that Bennett Island would be a good starting-place for future arctic expeditions. It was only on August 30 that the expedition discovered the first traces of men on the Faddeyeff Islands; and its further advance towards the delta of the Lena is well known. The scientific results of the *Jeannette* expedition cannot be yet completely appreciated, observes Herr Wichmann, but the note-books and surveys of its members having been preserved, as well as a good part of the collections, it is to be expected that they will contribute to a great extent to increase our knowledge of this part of the Arctic Ocean. The discovery of three new islands confirms the statements of Sannirikoff, who stated he saw land from the Faddeyeff Islands, and renders probable the existence of a whole archipelago in that part of the ocean. The exploration of the fauna and flora of the New Siberian Islands, which never was done before during the summer, promises interesting results. The problematical *polynias*, which stopped the advance of the sledge parties of Hedenström, Wrangel, and Anjou are not due to some warm currents, such having not been noticed during the temperature-observations of the *Jeannette*; they are simple openings in the ice, such as are observed elsewhere. Finally, the search expedition must give most important corrections to the maps of the Siberian coast between the Olenek and the Yana rivers, which has not been visited for sixty years; the observations of the American expedition will correct many of the observations of Lieut. Anjou. We may add to these expectations of Herr Wichmann that, as the Arctic law that "each polar expedition safely reaches the points which were sighted by the preceding one," will probably be true also for the North Siberian Seas, we must soon expect new and important discoveries in that direction, now that the way was opened to explorers of those parts of the Arctic seas.

#### NOTES

WE regret to learn that M. Joseph Liouville, the editor of the *Journal de Mathématiques*, died in Paris on September 7 at the age of seventy-six years. For some time back he had retired from his editorship and appointed M. Resal, a member of the Institute, as his successor. M. Liouville was born in St. Omer, admitted to the Polytechnic School in 1825, and appointed in 1829 an engineer of the Ponts-et-Chaussées. He soon resigned in order to devote himself entirely to the study of pure mathematics. He was elected in 1839 a member of the section of geometry in the Paris Academy. In 1848 he was sent by the electors of the Meurthe to the National Assembly, where he supported Arago's policy. In 1862 he was appointed a member of the Bureaux des Longitudes.

A MONUMENT to Becquerel, the French electrician, will be inaugurated this month at Chatillon.

DR. LEMSTRÖM, of Helsingfors, begins to-morrow a series of measurements of terrestrial currents, which measurements will be continued the 1st and 15th of each month. They will be made on two telegraphic lines, one of which, between Torneo and Helsingfors, runs north and south, and the other, between Mariehamn, on the Åland islands, and Kexholm, runs west and east.

THE Council of the Parkes Museum have just acquired new premises in Margaret Street, Cavendish Square, to which the museum is to be removed from University College as soon as the alterations and additions, which are now being made under the direction of Mr. Mark H. Judge, A.R.I.B.A., are completed. The new museum will consist of a central hall, suitable for meetings and lectures, a library and corridors, all lighted from the top and well suited for exhibition purposes. The meetings